60% or more and an average reflectance of about 15% for visible rays.

REMARKS

Entry of the foregoing amendments, and reexamination and reconsideration of the subject application, pursuant to and consistent with 37 C.F.R. § 1.104 and § 1.112, and in light of the following remarks, are respectfully requested.

Preliminarily, a revocation and new power of attorney, with a new correspondence address, are submitted with this paper. The Examiner is requested to assure that the correct **new correspondence information** is entered into the USPTO's database.

Acknowledgment of the foreign priority claim is noted.

Prior to addressing the rejections with particularity, Applicants would reiterate the invention as presently defined by claim 1; namely, an indium oxide and tin film that reflects heat rays by an increasing amount as the wavelength increases, and that significantly transmits visible light. As noted in the specification (*e.g.*, second paragraph, page one), fire-protection glass must reflect and/or attenuate infrared radiation that would otherwise cause a fire in an adjoining area by transmission through the glass, and still allow people escaping or fighting the fire to see through the glass.

Claim 1 also has been amended, as supported at least by the data shown in Table 1, to recite the reflectance in the visible range of about 15%; the data in the table show 15.5% ({12 + 19} ÷ 2 = 15.5). No new matter is added.

Rejection over Friedman (et al.) in view of Taga (et al., cited as GB 2,122,919)

The rejection of claims 1-4, 6, 9, and 10 as obvious over these references is respectfully traversed.

While Friedman alludes to "heat reflectance" surface treatments for glazing substrates in the portion at column six cited in the Office Action, no specifics are given, and no teach is made as to the composition, whether a polymeric surface treatment (as in the Friedman polymeric interlayer) or an inorganic surface

treatment. Further, no mention is made of the need to maintain transmission of visible radiation while reflecting heat.

Taga is directed not to "fire" protection but to heat shielding for lower temperature applications, such as vehicle and building exterior windows and peep hole glasses for furnaces and the like (pg. 1, ln. 8-14 and ln. 28-33).

In fact, as noted specifically at lines 28-33 of page one, Taga are trying to minimize IR reflection to avoid the "secondary problem" of heat pollution. In stark contrast, in the environment of a fire, to which the claimed invention is directed, reflection of the heat back into the fire-containing area is not a problem. Rather, containing the heat where it exists, by having high reflectivity, and preventing its spread via a glazing portal by having low transmission, is the solution the present invention provides.

Fig. 1 of Taga shows a typical ITO (indium-tin oxide) film (*see* pg. 2, ln. 26-28), wherein the reflectivity (curve 104) is deficient at meeting the specifications for reflectance recited in claim 1 of this application. Comparing Figs. 1 and 4, and the disclosure at page three (ln. 9-16, for example), Taga are attempting to increase the thermal absorption of the ITO layer.

Taga's teachings are inapplicable to *fire* protection glass. Taga realizes this by noting that the ITO layer is on the "outside" and is very thin so that "it is extremely easy to cool it [the ITO layer] through heat exchange with the atmosphere . . . so that in practical applications internal temperature rise causes no real problem." (Page 3, ln. 38-42.) Accordingly, Taga's teachings are inapplicable to a fire prevention glazing, where absorption of the heat will eventually damage the glazing or the structure supporting the glazing, and where there is no cooling through heat exchange with the atmosphere, because the atmosphere is likely at least as hot, and probably much hotter, than the glazing.

Therefore, the position stated in the Office Action over-simplifies that ITO layers are used in heat shielding applications because they do not transmit the radiation. Clearly, the impinging thermal energy must be absorbed or reflected if not transmitted. For Taga, the intent is to absorb the energy because the quanta of energy is rather low and the resulting heat can be dissipated. However, in the context of fire, the resulting heat cannot be dissipated so easily, and thus reflect

back towards the source is the preferred method for dispersing the impinging thermal energy. Further, at the heat quanta present in a fire, some of the heat will be re-radiated on the other side of the glazing, thereby defeating the purpose of the present invention to provide safe passage on the uninvolved side of the glazing. Using Taga's coatings on Friedman's laminated glazing does not arrive at the present invention or achieve the properties and structure necessary for a fire-protecting glazing as claimed, so this rejection should now be withdrawn.

The description at page five of Taga cited in the rejection confirms the absorptive characteristics of that coating; note the description of anti-fogging at lines 42-45. Note also Table 1, wherein the conventional ITO coating has a reflectivity at 1800nm of 43%, whereas the present invention requires at least 50%. Also, Taga's inventive coating has a reflectivity of only 15%. Taga's other embodiments in Figs. 6 and 9 show a reflectivity at 1500 nm at less than 50%, whereas the present claim requires at least 50%.

The description at page 13 (lines 47-51) of Taga is merely an invitation to experiment, for Taga has not addressed or appreciated the affect of heat absorption on glass used in high temperature applications such as furnaces. Merely alleging that the properties of the coating can be varied is not a teaching how to vary the coating for a particular application. As noted, because Taga intends to absorb heat, that heat must be dissipated, either by re-radiation (not addressed by Taga) or by conduction through the structure holding the window (which is probably safe for a furnace). This description by Taga, even in combination with Friedman, does not render obvious the claimed invention.

Rejection over Friedman and Taga in further view of Terneu (et al.)

The rejection of claim 8 as obvious over these references is respectfully traversed. As noted above, the combination of Friedman and Taga does not render obvious claim 1. As claim 8 depends on claim 1, and Terneu's disclosure does not cure the deficiency in the primary and secondary references, claim 8 would not have been obvious from this combination of references, and so this rejection also should now be withdrawn.

Rejection under 35 U.S.C. 112

The amendment to claim 1 overcomes this rejection.

Conclusion

In light of the foregoing remarks, further and favorable action, in the form of withdrawal of the rejections, and issuance of a notice of allowance, are believed to be next in order, and such actions are earnestly solicited.

Petition for Extension of Time

Pursuant to the provisions of 37 CFR 1.136(a), Applicants hereby petition for a two month extension of time to 21 August 2003 in order to respond to the Office Action dated 21 March 2003. Please charge the fee of $410 and any other fees under 37 C.F.R. § 1.16 or § 1.17 necessitated by this paper to Deposit Account No. 502144.

Respectfully submitted,

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21 August 2003

APPENDIX SHOWING MARKUPS OF AMENDMENTS

IN THE CLAIMS:

1. (Twice amended.) A fire-protection glass product having a heat shielding characteristic, comprising:

a plurality of fireproof glass plates;

a resin intermediate layer interposed between adjacent ones of said glass plates; and

a heat-ray reflection film formed on the surface of at least one of said glass plates, said heat-ray reflection film being made of indium oxide containing tin and having a reflectance of 50% or more, 70% or more, and 80% or more, for ~~a~~ light ~~of~~ having a wavelength of 1500nm, 2500nm, and 3000nm, respectively, and an average transmittance of 60% or more and an average reflectance of about 15% ~~or less~~ for visible rays.